HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P.O. Box 272400
Fort Collins, Colorado 80527-2400

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Inventor(s):	Susie Wee et al.	**Confirmation No.:**	8759
Serial No.:	09/557,991	**Examiner:**	Shawn An
Filed:	April 25, 2000	**Group Art Unit:**	2613
Title:	METHOD FOR DOWNSTREAM EDITING OF COMPRESSED VIDEO		

MAIL STOP APPEAL BRIEF-PATENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF

Sir:

The Appellants respectfully submit this appeal brief in response to the Office Action mailed March 22, 2004, finally rejecting claims 11-20. The Notice of Appeal was filed on June 28, 2004.

I. REAL PARTY IN INTEREST

Hewlett-Packard Development Company, L.P. of Houston, Texas is the real party in interest of this appeal by virtue of an assignment recorded at reel 011128, frame 0191.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

III. STATUS OF CLAIMS

Claims 11-30 are pending in this application. Claims 11-20 are finally rejected under 35 U.S.C § 103(a) over Meyer (5,502,493) in view of Bailleul (6,181,743), and claims 21-30 are allowed. Claims 11-20 are the subject of this appeal. The appealed claims 11-20 are set forth in the attached Appendix A. Claim 11 is independent, and claims 12-20 ultimately depend from independent claim 11.

IV. STATUS OF AMENDMENTS

Claims 11-20 were not amended after the final rejection. The appealed claims 11-20 are set forth in the attached Appendix A.

V. SUMMARY OF THE INVENTION

According to an embodiment, a video compression system utilizes independently encoded regions (IERs) to permit selective extraction and editing of image objects or other select portions of video frames from a sequence of compressed video frames without necessarily decompressing all the image data in the video sequence. The compression system independently encodes regions in a video sequence such that an IER can be decoded, edited, and reinserted into the video sequence without decoding the entire video sequence.

An example of method for independently encoding a region is shown in figure 7 and described on pages 36-37. In this example, the number of regions in a frame to be independently encoded is determined. For example, a frame may have several regions to be independently encoded, such as regions associated with a background of a frame, a logo in the frame, and an object in the frame (e.g., a person or ball). The frame is divided into slices. The boundaries for each slice are determined based on the regions. In particular, software determines where each image slice should begin and end, and which region each slice should be associated with. Then, a region map is created that identifies image slices for each IER in the frame. Each frame is compressed according to its region map such that an IER in a frame can be decompressed based on the region map without decompressing the entire frame or sequence of frames if the related IERs are contained in several frames.

Related IERs may be provided in several frames in a video sequence. For example, the related IERs may be associated with an image object provided in several frames in a sequence, such as a moving ball shown in several frames. In order to selectively extract the related IERs, motion compensation is constrained so that motion vectors for an IER *cannot point* away from or outside of a related IER in a different, anchor (or reference) frame. In

other words, a motion vector for an IER in a dependent frame in a video sequence points only to a related IER in one or more anchor frames. Thus, when an IER in a dependent frame is decoded, the corresponding IER in an anchor frame may also be decoded to extract the image object in the related IERs from the video sequence without decoding the entire sequence.

An example of a method for performing motion vector search and compensation is described on pages 37 and 41-43 and shown in steps 273, 275, 277, 279-281, and 283 of figure 9. In particular, motion search is limited to candidates only found within the same region group in a reference or anchor frame. For example, motion search is performed for an IER in a dependent frame. The target search area in an anchor frame is limited to the region of the anchor frame identified as being related to the IER in the dependent frame. IERs in different frames may be related, for example, if they include the same image object in multiple frames or the same region of interest in multiple frames. Thus, a resulting motion vector for an IER in a dependent frame only points to the related IER in the reference or anchor frame. This feature is further described in detail below with respect to the examples shown in figures 12-15 and 21.

To take an example of IERs from the Applicants' specification, figures 12-14 illustrate a group of pictures (GOP) in a video sequence. The GOP in this example includes three frames 335, 337, and 339 showing a moving ball, however, a GOP may include one to two dozens of frames. Also, a video sequence may include multiple GOPs. Figures 12-14 showing the three frames 335, 337, and 339 in the GOP are provided below.

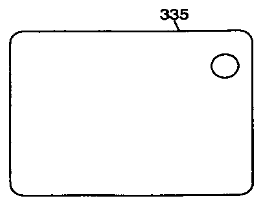

FIG. 12

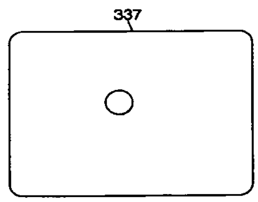

FIG. 13

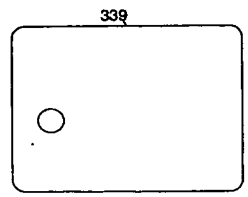

FIG. 14

Each of the frames 335, 337, and 339 is divided into slices, which are used to identify the locations of the IERs in each frame. As shown below, figure 12 shows the first frame 335 in the GOP, and figure 21 shows an example of the frame 335 divided into slices. Similarly, figure 14 shows the third frame 339 in the GOP, and figure 15 shows an example of the frame 339 divided into slices. Although not shown, the frame 337 is also divided into slices.

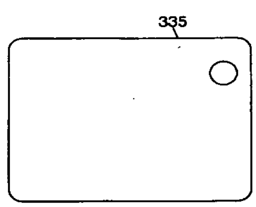

FIG. 12

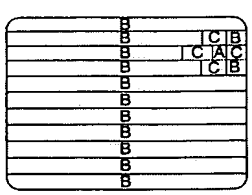

FIG. 21

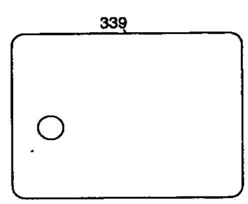

FIG. 14

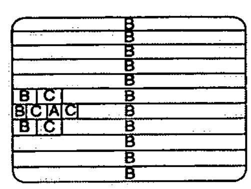

FIG. 15

In this example, each of the frames 335 and 339 includes three IERs A-C. The IER A includes image data for the ball, the IER B includes image data for the background (e.g., a blue sky background), and the IER C includes image data for the transition from the ball to the background. Figure 15, for example, includes nineteen slices for defining the locations of the IERs in the frame 339. If one desired to extract only the ball from compressed image data representing the frame 339 shown in figure 15, then the IERs A and C, including ball data, are decoded instead of decoding the entire frame.

Each of the IERs A-C requires limitation during motion search, such that motion vectors and residuals for data within these IERs point only to corresponding regions in a prior frame. For example, figure 15 represents the third frame 339 in the GOP and figure 21 represents the first frame 335 in the GOP. If it is assumed that the frame 339 represents a dependent "P" frame and the frame 335 represents an independent "I" frame, then all the motion vectors in the IER A data for the frame 339 point only to the IER A data for the frame 335. Similarly, all the motion vectors in the IER B data for the frame 339 point only to the IER B data for the frame 335, and all the motion vectors in the IER C data for the frame 339 point only to the IER C data for the frame 335. This mutual independence, i.e., the limitation that data from outside a region cannot have motion vectors and residuals pointing into the region, is relatively important, since without this limitation, changing data in a region of interest might invalidate motion vectors and residual data from another frame outside the group. Thus, an embodiment of the Applicants' invention relates to a way of decoding limited parts of a video sequence without decoding the entire frames of the entire sequence. The ability to decode limited parts of a video sequence is provided by using a motion vector for a subset of slices, such as the slices for the IER A in the frame 339, pointing to a related

subset of slices in another frame, such as the slices for the IER A in the frame 335. This saves a considerable amount of time, because a particular image in a frame may be edited without decoding an entire frame or without decoding entire frames in a group of frames.

In one embodiment, information regarding the slices in each frame may be provided in header information for a bitstream including the compressed image data for each frame in a GOP. As described above with respect to independently encoding regions, as part of the encoding process a region map is developed for each frame of the GOP, which indicates how a frame is sliced and identifies the subset of slices associated with each IER in a frame. The region maps may be provided in the header information. Each region map may include the total number of image slices in a respective frame and the relative position of the image slices for each IER in the frame. The GOP is compressed according to these region maps and the result of this encoding process is a bitstream of compressed video with IERs. A decoder receiving a region map may use this information to decode an IER of interest in a frame. In one example, the IER of interest may include a fixed spatial region across multiple frames, such as a logo fixed in one position. In another example, the IER of interest may vary in location across multiple frames, such as the ball shown in figures 12-14.

After an IER is decoded, the resulting image may be edited, recompressed and reinserted into the bitstream for the video sequence. Examples of decoding, editing, and reinserting slices associated with an IER of interest is described on pages 57-66 of the specification and shown in figures 25-29. Decoding may include decompressing an IER of interest into the spatial domain using the header information to identify the location of the slices including the IER of interest. Examples of editing an IER may include inserting a logo, color correction, fast forward and fast backward editing, splicing image sequences, scaling,

cropping, and adjusting perspective of an image object. After editing, the image data is bitstream encoded to take the place of the slices that were decoded. For example, the edited and re-encoded slices are inserted into the bitstream and the header information may be adjusted to reflect the newly inserted slices.

VI. ISSUES

Whether the 35 U.S.C. § 103(a) obviousness rejection of claims 11-20 based on Meyer in view of Bailleul should be reversed.

VII. GROUPING OF CLAIMS

Claims 11-20 are directed to a method of processing a bitstream representing a compressed image frame sequence. Claims 11-20 do not stand or fall together for the reasons stated below.

VIII. ARGUMENT

Claims 11-20 stand rejected as being obvious over Meyer in view of Bailleul. The rejections of claims 11-20 must be reversed because neither Meyer nor Bailleul, separately or in combination, teach or suggest all the elements of claims 11-20. The following first provides a brief summary of Applicants' arguments and, thereafter, provides a discussion of the law and the errors present in the appealed rejections.

ARGUMENT SUMMARY

An embodiment of the Applicants' invention provides a method for independently encoding regions in each frame of a sequence of frames. The IERs are sliced so that the position of an IER of interest among a plurality of IERs in a frame can be identified to selectively extract the IER of interest for editing or other purposes. Also, during encoding, motion compensation is constrained so that a motion vector for an IER, e.g., a subset of slices representing the IER in a dependent frame, *cannot point* away from or outside of data for a related IER in a different, anchor or reference frame. This feature provides the ability to extract limited amounts of compressed data from a sequence of frames. Conventionally, the entire sequence of frames is decoded in MPEG-2 to extract a region or object.

Independent claim 11 recites,

> ... the subsets [of image slices for the frame] being independently encoded from other image slices not in the subsets, such that any motion vectors necessarily point to an identified subset of another frame ... .

- Neither Meyer nor Bailleul teach or suggest all the elements of claim 11 including the motion vectors that necessarily point to an identified subset of another frame.
- The motion vectors recited in claim 11 are not inherent in Meyer.
- It would not have been obvious to one of ordinary skill in the art to combine Bailleul with Meyer.
- All the elements of dependent claims 12-20 are not taught or suggested by Meyer in view of Bailleul.

DISCUSSION OF THE LAW

Obviousness

To establish *prima facie* obviousness of a claimed invention, all claim elements must be taught or suggested by the prior art. See In re Royka, 490 F.2d 981, USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." See In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. See In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

Inherency

To establish *prima facie* obviousness of a claimed invention, all claim elements must be taught or suggested by the prior art. A claim element not explicitly taught by the prior art may be an inherent feature of the prior art. However, it is the burden of the Examiner and not the Applicants to prove that the claimed feature is inherent. Secondly, to establish inherency, the Examiner must make clear that the missing descriptive matter is *necessarily present* in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. "Inherency, however, *may not be established by probabilities or possibilities*. The mere fact that a certain thing may result from a given set of circumstances is not sufficient." *In re Robertson,* 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) (citations omitted).

Motivation

"The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference.... Rather, the test is what the combined teachings of those references would have suggested to those of ordinary skill in the art." See In re Keller, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981). See also In re Sneed, 710 F.2d 1544, 1550, 218 USPQ 385, 389 (Fed. Cir. 1983). Further, In re Lee, 277 F.3d 1338, 61 U.S.P.Q. 2d 1430 (Fed. Cir. 2002), the court rejected, as inadequate, an Examiner's statement that it would have been obvious to a person of ordinary skill to combine two references without pointing to a direct and explicit teaching to combine the references, and citing numerous cases for that legal holding. MPEP §2143.01-.02. Therefore, before a claim can be rejected for obviousness under 35 U.S.C. § 103(a), not only must the prior art teach or suggest each element of the claim, the prior art must also suggest combining the elements in the manner contemplated by the claim. See Northern Telecom, Inc. v. Datapoint Corp., 908 F.2d 931, 934 (Fed. Cir. 1990); In re Bond, 910 F.2d 831, 834 (Fed. Cir. 1990). The Examiner bears the initial burden of establishing a *prima facie* case of obviousness. MPEP § 2142. To satisfy this burden, the Examiner must show, among other things, that there is some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify or combine the references and that, when so modified or combined, the prior art teaches or suggests all of the claim limitations. MPEP § 2143.

MEYER IN VIEW OF BAILLEUL FAILS TO TEACH OR SUGGEST ALL THE ELEMENTS OF CLAIM 11

The Examiner has failed to establish a prima facie case of obviousness. The Examiner's rejections of claims 11-20 must be reversed because Meyer in view of Bailleul fails to teach or suggest all the elements of claim 11, including the claimed motion vectors.

For example, independent claim 11 recites, among other features:

> ... the subsets [of image slices for the frame] being independently encoded from other image slices not in the subsets, such that any motion vectors necessarily point to an identified subset of another frame ... .

Neither Meyer nor Bailleul teach or suggest this claimed subject matter.

Meyer is directed to parallel processing of video signals, including control information. As disclosed in Meyer, to effectively receive digital images, a decoder must recognize control portions, extract necessary control information, and use the extracted data to process the video signal. *See* Meyer, column 2, lines 12-15. Using existing techniques, a decoder could be implemented on a single processor having a complex design and operating at a high speed to perform these operations, but would suffer from complexity and synchronization issues. *See* Meyer, column 2, lines 16-25. Meyer discloses a solution to the single processor decoder that includes a multi-processor system having a master digital signal processor that recognizes variable control information and that directs control data and video data to two other processors as appropriate.

In the office action mailed on November 10, 2003 (*i.e.*, the office action just prior to the final rejection), where Meyer was first cited by the Examiner, the Examiner cites figure 5, column 8, lines 63-67, and column 9, lines 1-15 to teach the claimed motion vectors. In these cited portions, Meyer discloses a method of decoding image slices including sending

different slices for a given frame to parallel decoders. However, using multiple processors to process different slices in decoding has utterly no pertinence to the claimed invention.

Claim 11 recites subsets of image slices being independently encoded from other slices, such that any motion vectors necessarily point to an identified subset of another frame. As described above, an embodiment of the Applicants' invention includes independently encoded regions (IERs) comprised of subsets of image slices and constrained motion vectors, where a motion vector for an IER in one frame, such as a dependent frame, cannot point to unrelated IERs in an anchor frame. By using the IERs, including the constrained motion vectors, an embodiment of the Applicants' invention provides the ability to extract limited amounts of compressed data to extract an image object of interest or a region of interest from a sequence of frames without decoding the entire sequence of frames.

Meyer fails to teach or suggest subsets of slices independently encoded such that any motion vectors necessarily point to an identified subset of another frame. Meyer discloses parallel decoding (not independently encoding) of slices of a frame. The slices are decoded in a round-robin fashion, whereby a first encountered slice is sent to a first decoder, a second encountered slice is sent to a second decoder, etc. *See* Meyer, column 8, lines 32-column 9, line 4. However, there is no teaching in Myer that a slice or subset of slices is independently encoded, and there is no teaching in Meyer of the claimed motion vectors.

The final rejection, on page 2, cites column 5, lines 14-18 and column 8, lines 33-51 of Meyer to teach subsets of slices independently encoded from other slices. The final rejection further cites figure 5, column 8, lines 63-67, column 9, lines 1-15 and "inherency emphasized" to teach the claimed motion vectors. With regard to the cited passages, Meyer discloses receiving image bit streams including slice start codes. The slice start codes are

used to send slice information to a decoder. As described above, the slices are decoded in a round-robin fashion, whereby a first encountered slice is sent to a first decoder, a second encountered slice is sent to a second decoder, etc. The slice start codes are used to determine when a new slice is encountered to send to a decoder.

Simply because slice start codes are provided in an image bit stream does not require that subsets of slices in a frame to be independently encoded from other slices in the frame. The slice start codes are used to identify image data for a single slice and not a subset of slices in a frame. Furthermore, there is no reason to identify a subset of slices in Meyer. Unlike an embodiment of the Applicants' invention, Meyer does not use subsets of related slices in multiple frames to extract an image object without necessarily decompressing the entire sequence of frames. Thus, Meyer fails to teach or suggest the claimed subsets being independently encoded.

In addition, the claimed motion vectors, which provide the ability to extract an image object from a sequence of frames without necessarily decompressing the entire sequence of frames, are not taught or suggested by Meyer. The passages of Meyer cited by the Examiner to teach this feature discuss the parallel decoding of slices which is unrelated to the claimed motion vectors. In the personal interview conducted on May 14, 2004, after the final rejection, the Examiner indicated the claimed motion vectors are not explicitly taught but are inherent in Meyer. The Applicants disagree, because the claimed motion vectors are not needed and are not necessarily present in Meyer, as described in detail below.

Bailleul does not remedy the deficiencies of Meyer. In fact, the Examiner agreed in a personal interview conducted on October 31, 2003, and as stated in that interview summary, that Bailleul fails to teach or suggest the subsets [of image slices for the frame] being

independently encoded from other image slices not in the subsets, such that any motion vectors necessarily point to an identified subset of another frame.

Bailleul was cited to teach the following elements of claim 11:

> selectively editing decoded data;
> encoding new image slices from decoded data and edited data; and
> inserting the new image slices into the bitstream, and generating a representative output signal.

Bailleul relates to a system that calls for decoding of a frame for logo insertion, and discloses two implementations for this purpose. See Bailleul, figure 3, column 5, lines 44-57 and column 1, line 58-column 2, line 18. In one implementation each entire frame of a sequence is decoded. For example, in figure 5, the entire image input signal, processed through blocks VLD, IQ, and IDCT is decompressed through the IDCT (inverse discrete cosine transform). See Bailleul, column 5, lines 18-38. With reference to figure 6 and starting at column 5, line 39, Bailleul discloses a second implementation where only part of a frame is processed to insert a logo, i.e., the replacement of an area of a picture or sequence of pictures, without modifying the other parts of the picture. See Bailleul, column 5, lines 39-51. This implementation includes four steps comprising an estimation step, where current data is estimated based on data from past frames and current residual data, a logo processing step to conform the logo to the current picture, a logo clipping step, and a logo insertion step.

The implementations of Bailleul do not teach or suggest the claimed invention. Firstly, the logo insertion is performed at the macroblock level and not at the slice level. See Bailleul, column 5, lines 60-62, where estimation is performed for each macroblock. Thus, Bailleul does not necessarily teach or suggest encoding new image slices and inserting the new slices. Secondly, Bailleul does not teach or suggest the claimed motion vectors.

To establish *prima facie* obviousness of a claimed invention, all claim elements must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, USPQ 580 (CCPA 1974). Applicants respectfully submit that a *prima facie* case of obviousness has not been established since Meyer in view of Bailleul does not teach or suggest all the elements recited in at least independent claim 11. Thus, the rejection of claims 11-20 must be reversed.

THE MOTION VECTORS RECITED IN CLAIM 11 ARE NOT INHERENT IN MEYER

As discussed above, Meyer fails to teach or suggest the motion vectors in claim 11. In particular, claim 11 recites,

> ... the subsets [of image slices for the frame] being independently encoded from other image slices not in the subsets, such that any motion vectors necessarily point to an identified subset of another frame ... .

The Examiner, however, alleged that the claimed motion vectors are inherent in Meyer. The Applicants respectfully disagree. In the personal interview conducted on May 14, 2004, the Examiner indicated that Meyer discloses dividing an image into slices as shown in figure 5, and that a motion vector for a macroblock of an MPEG encoded image, as is known in the art, points to another macroblock of an MPEG encoded image. The Examiner then concluded that Meyer inherently teaches motion vectors for a subset of slices of a frame inherently point to an identified subset of another frame.

To establish inherency, the Examiner must make clear that the missing descriptive matter is *necessarily present* in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. "Inherency, however, *may not be established by probabilities or possibilities*. The mere fact that a certain thing may result from a given set of

circumstances is not sufficient." *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) (citations omitted). In fact, there is no teaching in Meyer that would require the use of motion vectors that point to an identified subset of slices in another frame. Unlike an embodiment of the Applicants' invention, which uses the claimed motion vectors to extract an image object, represented by subsets of identified slices, from a sequence of frames instead of requiring the decoding of the entire sequence of frames, Meyer has absolutely no teaching with respect to selectively extracting image objects. Furthermore, there is no suggestion in Meyer that links specific subsets of slices in an anchor or reference frame (e.g., a prior frame) with specific sets of slices appearing in a dependent frame (e.g., a later, different frame), and decoding "only" the linked sets, such as described above with respect to the ball in figures 12-15 and 21 of the Applicants' invention. Similarly, there is no disclosure in Meyer that requires certain slices from multiple frames to go to one and only one decoder to decode a subset of slices, e.g., the round robin-distribution called for by Meyer feeds slices to a different decoder for a different frame. Thus, Meyer more than likely, if not explicitly, uses conventional decoding techniques for editing which do not use the claimed motion vectors. The mere possibility that Meyer may use the claimed motion vectors does not establish inherency.

In the advisory action mailed on June 7, 2004, the Examiner cited two references to suggest the inherency of the claimed motion vectors. The first reference, Minami (U.S. Patent Number 6,380,986), discloses several new methods for obtaining motion vectors, which are by no means methods performed by all conventional decoders including the decoders of Meyer. Thus, the methods of Minami are not inherent in the decoder of Meyer. In Minami, the Examiner cited step S55 in figure 10. Figure 10 is associated with the

embodiment 1-6 of Minami, which discloses a method for decoding related to image slices. In the step S55 of figure 10 cited by the Examiner, Minami discloses a motion vector is determined for each target template. Each target template, however, is a portion of slice, e.g., two target templates per slice, instead of a subset of slices. See Minami, column 14, lines 31-36 and lines 60-65. Minami discloses using the target template to search a designated search area in for example a reference frame to obtain a motion vector for the target template. Eventually, a motion vector is determined for each target template in a slice. See Minami, column 14, lines 44-45. Hence, Minami discloses an improved technique for performing motion search that uses a target template, comprised of a portion of slice, to search a designated search area. However, Minami does not disclose that it is required for a decoder, such as the decoder of Meyer, to encode subsets of image slices for a frame independently from other image slices not in the subsets, such that any motion vectors necessarily point to an identified subset of another frame. Instead, Minami discloses performing a motion search for a portion of a slice instead of a subset of slices. Furthermore, unlike an embodiment of the Applicants' invention, which uses the claimed motion vectors to partially decode slices of frames instead of requiring decoding of entire frames for editing, Minami has absolutely no teaching with respect to editing frames. Similarly, the second cited reference, Johnston (U.S. Patent Number 5,128,756) does not teach the claimed motion vectors or the ability to extract limited information from a sequence of compressed frames for editing.

Johnston discloses a high definition television (HDTV) coding arrangement. Limited bandwidth is available for transmitting an HDTV signal, so Johnston discloses limiting the number of motion vectors transmitted in the signal and improving the compression of motion vectors. See Johnston, column 11, lines 45-65. In column 12, lines 11-39, cited by the

Examiner, Johnston discloses a technique for determining the number of bits needed to encode a slice of motion vectors. A slice, as used in Johnston, includes a 2 x 3 array of 32 x 16 motion vectors (a total of six 32 x 16 motion vectors in all), which is unrelated to the Applicants' invention. See Johnston, column 12, lines 6-10. A first 32 x 16 motion vector of the slice is variable length encoded, and then the remaining 32 x 16 motion vectors in the slice are specified by the difference between the vectors and the first vectors. See Johnston, column 12, lines 15-18. Thus, Johnston provides a technique for compressing a set of 32 x 16 motion vectors to fit within the bandwidth available for transmitting an HDTV signal.

It is clear that Johnston is completely unrelated to the claimed motion vectors and permitting selective extraction and editing of image objects or other select portions of video frames from a sequence of compressed video frames without necessarily decompressing all the image data in the video sequence. Again, it appears that the Examiner has cited a reference merely because of the mention of "slice". Johnston fails to teach or suggest the claimed motion vectors, and thus, does not provide evidence that the claimed motion vectors are inherent in Meyer.

IT WOULD NOT HAVE BEEN OBVIOUS TO ONE OF ORDINARY SKILL IN THE ART TO COMBINE BAILLEUL WITH MEYER

The rejection of claims 11-20 combines Bailleul with Meyer to teach the claimed selective editing, encoding, and insertion of new image slices into a bitstream. The final rejection states on page 4 that it would have been obvious to one of ordinary skill in the art to incorporate the editing concept/method taught by Bailleul in Meyer for an efficient editing/splicing operation.

The motivation to combine is improper because Meyer is unrelated to image editing and splicing. Meyer discloses a variable length data decoder that includes multiple processors to decode control and image data in real time. Bailleul is directed to a method for modifying data in an encoded data stream, such as adding a logo to an incoming video bitstream. One of ordinary skill in the art looking to modify the invention of Meyer may look to other parallel processing techniques or decoding circuits for identifying possible modifications to Meyer. However, one of ordinary skill in the art would not readily look to the image editing field to identify possible improvements or modifications to Meyer's parallel processing decoder. The logo insertion techniques of Bailleul have no relation to the parallel processing decoder of Meyer. In fact, the logo insertion of Bailleul is a technique that would be performed by an encoder in a transmitter, such as a transmitter transmitting a video signal including the added logo, while the decoder of Meyer would be used in a receiver receiving the encoded signal.

FEATURES OF DEPENDENT CLAIMS 12-19 ARE NOT TAUGHT OR SUGGESTED BY MEYER IN VIEW OF BAILLEUL

Neither Meyer nor Bailleul teach or suggest many of the features of dependent claims 12-20. Claim 15 recites,

> wherein the information identifies image slices associated with an object that varies in frame position across the multiple frames and wherein receiving information includes distinguishing the subset from a variable number of other image slices not associated with the subset.

Claim 16 recites a region map. These features are not taught or suggested by Meyer in view of Bailleul. According to an embodiment of the Applicants' invention, the motion vectors of claim 11 permit the independent encoding of an image object in a sequence of frames, such as the IERs for the ball shown in figures 12-15 and 21. Also, a region map is provided with each frame, such that a particular IER in a frame can be identified. Using the claimed motion vectors and the region map, the image object may be extracted from the sequence of frames without decoding the entire sequence of frames. Neither Meyer nor Bailleul teach or suggest the claimed features. The Examiner has failed to identify any teaching in Meyer or Bailleul that discloses information identifying image slices associated with an object that varies in frame position across the multiple frames, wherein the information distinguishes an identified subset of slices from other slices not in the subset. Meyer only discloses identifying a slice start code for sending slice data to a parallel decoder and not identifying an object in multiple frames. Also, Myer fails to teach or suggest information identifying a subset of slices that distinguishes the subset from other slices, and the claimed region map. Bailleul also does not teach or suggest these features. Thus, the rejections of claims 15-16 must be reversed.

Claims 19 and 20 are directed to inserting slice data of an adjusted bitstream and inserting new information identifying slices of the subset into a frame header of an output signal. Meyer does not teach or suggest adjusting a bitstream or inserting slice data. Bailleul was cited to teach editing and inserting data into a bitstream, such as adding a logo. However, Bailleul fails to teach or suggest inserting new information identifying slices into a frame header or inserting slice data. These features are important to an embodiment of the Applicants' invention, because the newly inserted slice data and frame header data is used to

subsequently identify IERs for decoding. Neither Bailleul nor Meyer teach or suggest these features. Thus, the rejections of claims 19-20 must also be reversed.

IX. SUMMARY

In view of the above, Appellants submit that all claims on appeal distinguish over the cited art. Appellants therefore respectfully request that the Board of Patent Appeals and Interferences reverse the Examiner's decision rejecting claims 11-20 and direct the Examiner to pass the case to issue.

Respectfully submitted,

Susie Wee et al.

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By Ashok K.

Ashok K. Mannava
Registration No.45,301

MANNAVA & KANG, P.C.
8221 Old Courthouse Road
Suite 104
Vienna, VA 22182
(703) 652-3822
(703) 880-5270 (facsimile)

Enclosure: Appendix A

APPENDIX A

11. (Previously Presented) A method of processing a bitstream representing a compressed image frame sequence, said method comprising:

receiving, for each of multiple frames, information identifying a subset of image slices for the frame, the subsets being independently encoded from other image slices not in the subsets such that any motion vectors necessarily point to an identified subset of another frame;

decoding the subsets;

selectively editing decoded data;

encoding new image slices from decoded data and edited data; and

inserting the new image slices into the bitstream, and generating a representative output signal.

12. (Previously Presented) A method according to claim 11, wherein generating an output signal includes generating an output signal compliant with MPEG-2 standards.

13. (Previously Presented) A method according to claim 11, wherein the information identifies image slices associated with a fixed spatial region across multiple image frames.

14. (Previously Presented) A method according to clam 13, wherein the editing includes inserting a logo within the fixed spatial region, and wherein generating an output signal

includes generating one of a television broadcast signal, video game data, an Internet video signal and a digital video disk (DVD) signal.

15. (Previously Presented) A method according to claim 11, wherein the information identifies image slices associated with an object that varies in frame position across the multiple frames and wherein receiving information includes distinguishing the subset from a variable number of other image slices not associated with the subset.

16. (Previously Presented) A method according to claim 15, wherein the information includes for each frame a map identifying total number of slices for the flame, and the relative position of image slices in the subset with respect to the total number of slices.

17. (Previously Presented) A method according to claim 11, wherein editing includes performing one of color correction, mixing images, removing an object from an image, scaling an object, cropping an object and adjusting perspective of an object within the subset.

18. (Previously Presented) A method according to claim 11, wherein:

decoding the subsets includes decompressing the subsets;

editing includes editing decoded and decompressed data to perform one of color correction, mixing images, removing an object from an image, scaling an object, cropping an object and adjusting perspective of an object within the subset; and

encoding decoded data and edited data includes compressing and coding decompressed data and edited data.

19. (Previously Presented) A method according to claim 11, further comprising adjusting a bitstream parameter to reflect newly inserted slice data.

20. (Previously Presented) A method according to claim 11, further comprising inserting new information identifying slices of the subset into a frame header of the output signal.